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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/736,499 | 12/15/2000 | Kunio Kishimoto | 43890-470 | 7834 |
| 7590 | 03/09/2004 | | EXAMINER | |
| McDERMOTT, WILL & EMERY | | | ELEY, TIMOTHY V | |
| 600 13th Street, N.W. | | | | |
| Washington, DC 20005-3096 | | | ART UNIT | PAPER NUMBER |

3724

DATE MAILED: 03/09/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) |
|------------------------------|------------------------|---------------------|
| | 09/736,499 | KISHIMOTO ET AL. |
| Examiner | Art Unit | |
| Timothy V Eley | 3724 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 15 October 2003.

2a) This action is **FINAL**. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-49 and 67 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-7,25,39-45,47-49 and 67 is/are rejected.

7) Claim(s) 8-24,26-38 and 46 is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 9.
4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
5) Notice of Informal Patent Application (PTO-152)
6) Other: _____

DETAILED ACTION

1. The indicated allowability of claims 1-7, 25, 39-45, 47-49, and 67 is withdrawn in view of newly discovered references. Rejections based on the newly cited references follow.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-5, 44, and 48, 49, and 67 are rejected under 35 U.S.C. 102(b) as being anticipated by the Japanese(10290072) reference.

a. The Japanese reference discloses a method of manufacturing a circuit board comprising the steps of: preparing a film-coated board material(1) by bonding a film material(2a) to at least one of a surface of the board material and a back surface of the board; forming at least one hole of a through-hole(3) and a non-through-hole using a laser beam, in the film-coated board material; wherein unnecessary material(6) is produced when the hole is formed and the unnecessary material sticks to the board material; the unnecessary material has at least one selected from the group consisting of affected portion, affected material and

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foreign matter which are generated from the board material; selectively removing the unnecessary material sticking to the film-coated board material without peeling the film material off the board material; disposing a conductive material in the hole formed in the film-coated board material, using the film material as a mask; and removing the film material from the film-coated board material after conductive material is disposed in the hole formed in the film-coated board material. See figures (a)-(e) and abstract.

b. Regarding claim 4, the film material is disposed on both the surface and back of the board material, and the hole is a through-hole that goes through the surface and the back of the film-coated board material.

c. Regarding claim 44, the step of disposing the conductive material in the hole includes a process of filling a conductive paste into the hole.

d. Regarding claims 49 and 67, said film material includes a thermosetting resin(polyethylene terephthalate) layer on two sides of the film material.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at

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the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 6,7,25,42,43, and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Japanese(10290072) reference in view of the Japanese(01214093) reference.

- a. The Japanese(10290072) reference is explained above.
- b. However, the Japanese(10290072) reference does not disclose removing the unnecessary material by the vibrational energy generated by a supersonic oscillator while immersing the film-coated board material in a cleaning tank having a cleaning solution and the supersonic oscillator.
- c. The Japanese(01214093) reference discloses removing unnecessary material by the vibrational energy generated by a supersonic oscillator while immersing a film-coated board material in a cleaning tank having a cleaning solution and the supersonic oscillator. See the figure and abstract.
- d. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of the Japanese(10290072) reference by removing the unnecessary material by the vibrational energy generated by a supersonic oscillator while immersing the film-coated board material in a cleaning tank having a cleaning solution and the supersonic oscillator to thereby insure better cleaning of the circuit board as taught by the Japanese(01214093) reference. Regarding claim 47, the hole inherently would be

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positioned above the supersonic oscillator(7) in the modified method.

e. Regarding claim 7, a flow of the cleaning solution is inherently created by the vibrational energy of the supersonic oscillator.

f. Regarding claim 25, the exact pressure of the supersonic oscillator would have been an obvious matter of choice to one having ordinary skill in the art at the time the invention was made since clearly the amount of vibrational energy must be sufficient to adequately remove the unwanted material.

6. Claims 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese(10290072) reference in view of the EPO(0568930) reference.

a. The Japanese(10290072) reference is explained above.

b. The Japanese(10290072) reference does not specifically disclose that the board material includes a reinforcement and thermosetting resin impregnated with the reinforcement and the reinforcement includes one of a woven cloth and a non-woven cloth.

c. The EPO reference disclose a board material which includes a reinforcement and thermosetting resin impregnated with the reinforcement and the reinforcement includes one of a woven cloth and a non-woven cloth.

d. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have

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modified the method of the Japanese(10290072) reference by using a board material which includes a reinforcement and thermosetting resin impregnated with the reinforcement and the reinforcement including one of a woven cloth and a non-woven cloth as taught by the EPO reference for providing a more secure circuit board.

7. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over the Japanese(10290072) reference in view of Noddin(5,965,043) et al.

a. The Japanese reference is explained above.

b. The Japanese reference does not disclose a step of disposing conductive material in the hole by performing conductive plating in the hole.

c. Noddin et al disclose a process of disposing conductive material in a hole in a circuit board by performing conductive plating in the hole.

d. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method disclosed by the Japanese reference by disposing conductive material in the hole by performing conductive plating as taught by Noddin et al in order to insure that the hole is adequately lined with conductive material.

Allowable Subject Matter

8. Claims 8-24,26-38, and 46 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in

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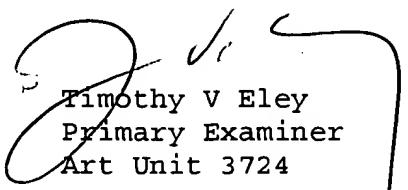
independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy V Eley whose telephone number is 703-308-1824. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Allan N Shoap can be reached on 703-308-1082. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Timothy V Eley
Primary Examiner
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